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ABSTRACT

A research study of 245 students from Korea, the Arab nations, and Nigeria was conducted to determine whether there are significant relationships between any of the three measures of the level of stress (anxiety, depression, and somatic complaints) among international college students. Variables analyzed in the study included English language proficiency; social interaction with Americans, co-nationals and other internationals; health;, financial conditions; nationality; length of stay; and marital status. Extensive use of questionnaires and follow-up phone calls revealed significant relationships between both anxiety and depression and English language proficiency and social interaction with Americans. Duration of stay was also found to be significant in determining overall stress levels; this was not found to be significantly different from marital status. In regard to anxiety the two best predictive variables were found to be social interactions with Americans and health conditions; it was concluded that frequent social interaction with Americans predicts a lower stress level and a poor heatlh condition is suggestive of a high stress level. It was also found that stress level becomes higher during the first and third year of stay in this country. Four recommendations were made to schools to help alleviate the stress and potential psychosomatic problems faced by international students on campus. Recommendations involved inter-cultural community activities, better information dissemination of counseling and stress management services, and the involvement of senior international students in informing new students of the services available. Contains 35 references. (GLR)

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Predictive Factors of Stress Among International College Students

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This study was accomplished as the author's doctoral dissertation at the University of Missouri in 1988, and the author currently works at the Southwest Alabama Mental Health as Coordinator in Monroeville, Alabama, and teaches at Mobile College.

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Abstract

This is a multiple regression analysis study which attempted to determine what variables predict the stress level related to anxiety, depression, and somatic complaints of international college students.

Predictive Factors of Stress Among International College Students

The educational sojourn of international students is a transition from one culture to another and from one environment to another. This transition implies a change in values, customs, beliefs, education systems, languages, social networks, climates, and food. The students are forced to adjust in a short period of time to living in another environment, and some students encounter difficulties in adjustment. Even for American college students, Maxwell (1974) noted that the initial period of adjustment was difficult. In his study, 30 to 50 percent expressed fears that they may not be able to meet college course demands. The problem is compounded for the international students, who must adjust to changes in values, customs, and language, in addition to the demands of college. Many studies have been conducted in the past in an effort to identify different adjustment problems encountered by international students (e.g., Peterson & Neumeyer, 1948; Forstat, 1951; Porter, 1962; Hart, 1974; Arubayi, 1980). Likewise, many studies have reported factors which relate to the adjustment difficulty of those students (e.g., Watson & Lipitt, 1955; Selltiz, Cook, Christ, & Havel, 1963; Spaulding, Flack, Tate, Mahon & Marshall, 1976).

Alexander, Klein, Workneh and Miller (1976) noted that international students are a high risk group under considerable stress. They pointed out adjustment difficulties prolonged as attributing to stress among the students. Stress is more likely to be experienced in the form of physical complaints, when it

becomes intense (Selye, 1956; Alexander et al., 1976). They noted that specific problems with language in listening to lectures or understanding readings, financial and other practical aspects might heighten anxiety among the students.

The English language proficiency has been emphasized as an important factor to contributing for success in academic life as well as in adjustment (e.g., Chu, 1922; Peterson & Neumeyer, 1948; Al-Shama, 1959; Beals & Humphrey, 1957; Akhun, 1961; Selltiz et al., 1963; Lado, 1964; Zain, 1965; Rising & Copp, 1968; Sharma, 1971; Kang, 1972; Hart, 1974; Ellis, 1978; Salim, 1984).

The frequency of social interaction with Americans as well as the language proficiency has been found to be positively related with the adjustment of international students (e.g., Selltiz, et al., 1963; Johnson, 1970; Jarrahi-Zadeh & Eichman, 1970; Klein, Alexander & Tseng, 1971; Hull, 1978; Furnham & Bochner, 1982; Vaz, 1984). Poor financial condition has also been found to be related with difficulty in adjustment (e.g., Peterson & Neumeyer, 1948; Forstat, 1951; Porter, 1962; Johnson, 1971; Chang, 1972; Hull, 1978; Salim, 1984). Poor health condition was also noted as related to adjustment difficulty (Peterson & Neumeyer, 1948).

Married students were adjusted more readily (e.g., Beebe, 1955; Porter, 1962; Hart, 1974, Arubayi, 1980), and length of stay in this country as positively related with the language proficiency had an effect upon adjustment (e.g., Lysgaard, 1955; Porter, 1962; Aliza, 1965; Hart, 1974). Nationality difference

factor was noted as related to differences in adjustment level because of differences in social interaction with Americans (e.g., Selltiz et al., 1963; Klein et al., 1971)

This research study attempted to determine what variables predict stress level among international college students, which may be related to anxiety, depression, and somatic complaints. Variables analyzed in the study included the English language proficiency, social interaction with Americans, co-nationals, and other internationals, health, and financial conditions, nationality, length of stay, and marital status.

Investigating what factors may be predictors of stress is essential in order to help those students understand manage their stress, and to aid counselors of colleges and universities in understanding them better and help them solve any psychosomatic problems.

In order to find best predicting variables of stress, research questions were developed:

1. Are there significant relationships between any of the three measures of the level of stress (anxiety, depression, and bodily discomfort) and any of the Likert-type variables, including English language proficiency, social interaction with Americans, co-nationals, or other internationals, career certainty, health condition or financial condition?

2. Are there significant relationships between any of the three measures of the level of stress and the categorical student demographic variables of nationality (Korean, Arab, and Nigerian), duration of stay (less than 1 year, between 1 and 3 years, and over 3 years), and marital status (married, single)?

3. Are there any combinations of two or more of the student demographic variables which can better explain the variability in the three measures of the level of stress than single variables along?

Method

Participants

Two hundred forty-five students were randomly selected from the entire population of the international students from Korea, the Arab nations, and Nigeria. One hundred students from Korea were selected out of 135, 100 students from the Arab nations out of 131, and 45 students from Nigeria out of 45 were selected at random. They were all full time students during the fall semester of 1987 at the University of Missouri in Columbia, Missouri. Both graduate and undergraduate students were included. The Arab nations represented in the study include Algeria, Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Mauritania, Morocco, Saudi Arabia, Sudan, Syria, Tunisia, and Yemen.

Measures

Stress level of the students was measured on three different aspects: anxiety, depression, and bodily discomfort. Anxiety level was measured utilizing the State-Trait Anxiety Inventory (STAI) (Spielberger, 1983), and depression level was measured by the Depression Adjective Check List (DACL) (Lubin, 1981). Twenty one items which describe specific bodily discomforts were utilized to check students' bodily discomfort on a Likert-type scale (never, sometimes, occasionally, frequently, always), which appear in Appendix. Alpha coefficient of these items was

computed as .86.

The questionnaire provided information on students' English language proficiency, social interaction with Americans, co-nationals, and other internationals, career certainty, health, and financial conditions. These demographic factors were measured on a Likert-type scale (very poor, poor, average, good, very good). In addition, three categorical demographic informations were provided by the questionnaire, such as nationality (Korean, Arab, Nigerian), duration of stay in this country (less than one year, between one and three years, over three years), and marital status (married, single).

Procedure

Questionnaires including STAI and DACL were mailed to 245 students. After follow-up mailing and phone calls, 177 were collected, resulting in a return rate of 72 percent. Eighty one Korean students (81%) responded, and 63 Arab students (63%) responded, and 33 Nigerian students (73%) responded to the mailing.

In order to answer the research questions, null hypothesis one to answer the first research question was tested computing Pearson correlation coefficients between each of the measures of stress and each of the Likert-type demographic variables. Null hypothesis two was tested to answer the second research question by using one-way analyses of variance for each of the demographic variables. Both individual univariate and overall multivariate analyses were performed. A post-hoc mean comparison was performed using Least Significant Differences (LSD) when the null

hypothesis was rejected. Null hypothesis three was tested through the use of multiple regression techniques to answer the third research question. All hypotheses were tested at the .05 level of significance.

Findings

Since significant relationships were found between both anxiety and depression and 1) English language proficiency and 2) social interaction with Americans, null hypothesis one was rejected on .05 level, which appear in Table 1. These relationships were negative. This indicated that higher levels of stress were associated with less proficiency in English and less socializing with Americans. All three measures of stress were associated with health, indicating that a less favorable health condition was associated with a higher stress level. Students' depression levels were also significantly related with their social interaction with other international students and with their career certainty after completion of study. There was no evidence of a statistically significant relationship between either socializing with people from their home country and level of stress or between their financial condition and level of stress.

As can be seen in Table 2, null hypothesis two was rejected for nationality. There was a significant difference in the average stress level of all three measures among all three nationalities. The nationality variable on overall stress level was also significant, using Pillai's Trace, with $F(6,330)=4.71$, $p<.001$. In order to find the patterns of the differences in the mean scores, a means comparison procedure was used. The results

Table 1

Results of Testing Hypothesis One for Significant Relationships between Likert-type Demographic Variables and Levels of Stress Variables Using the Pearson Correlation Coefficients

Demographic Variables	Stress Variables		
	Anxiety	Depression	Bodily Discomfort
English Language Proficiency			
r	-.17	-.28	-.13
p	.0211*	.0002***	.0987
Social Interaction with Americans			
r	-.26	-.30	-.14
p	.0006***	.0001***	.0588
Social Interaction with Co-nationals			
r	.09	.13	.13
p	.2585	.0787	.0808
Social Interaction with Other Internationals			
r	-.06	-.16	-.07
p	.4028	.0393*	.3738
Career Certainty or Uncertainty			
r	-.15	-.21	-.11
p	.0557	.0042**	.1415
Health Condition			
r	-.25	-.26	-.27
p	.0010***	.0004***	.0003***
Financial Condition			
r	-.15	-.13	-.05
p	.0558	.0880	.5287

Note. n=177. *p<.05. **p<.01. ***p<.001.

Table 2

Results of Testing Hypothesis Two for Significant Relationships between Stress Variables and Nationality Using One-Way Analysis of Variance

Stress Variables	Sources of Variation	Degrees of Freedom	Mean Square	F	p
Anxiety					
	Nationality	2	286.81	3.85	.0211*
	Error	166	72.62		
Depression					
	Nationality	2	299.20	12.56	.0001***
	Error	166	23.81		
Bodily Discomfort					
	Nationality	2	349.88	3.43	.0348*
	Error	166	102.08		
Multivariate		6,330		4.71	.0001***

Note. n=169. *p<.05. **p<.01. ***p<.001.

of Least Significant Differences (LSD) on these means showed that on STAI, Korean students had significantly higher anxiety level than Nigerians, but Arab students were not significantly different from either of the two nationalities. On DACL, Korean students were significantly higher than either of the other two nationalities, but Arabs and Nigerians were not significantly different. On bodily discomfort, Korean students were significantly higher than Arab students, but Nigerian students were not significantly different from either of those two nationalities.

Null hypothesis two was rejected for duration of stay. There was a significant difference in the average stress level of depression and bodily discomfort for the different durations of stay, which appears in Table 3. The duration of stay variable on overall stress level was also significant, using Pillai's Trace, with $F(6,330)=2.97$, $p<.01$. The results of LSD showed no significant differences in level of anxiety in the three lengths of duration of stay. Students who had stayed in this country less than one year scored significantly higher on DACL than those who had stayed more than three years. On bodily discomfort, students who had stayed more than one year but less than three years were significantly higher than either of the other two groups of students.

Null hypothesis two was not rejected for marital status. There was no significant difference in the average stress level of any of the three measures for different marital status, which appears in Table 4. Married students were not significantly

Table 3

Results of Testing Hypothesis Two for Significant Relationship between Levels of Stress Variables and Duration of Stay Using One-Way Analysis of Variance

Stress Variables	Source of Variation	Degrees of Freedom	Mean Square	F	p
Anxiety					
	Duration	2	25.19	.33	.7177
	Error	166	75.78		
Depression					
	Duration	2	81.84	3.10	.0478*
	Error	166	26.43		
Bodily Discomfort					
	Duration	2	582.94	5.66	.0042**
	Error	166	999.51		
Multivariate		6,330		2.97	.0077**

Note. n=169. *p<.05. **p<.01. ***p<.001.

Table 4

Results of Testing Hypothesis 2 for Significant Relationships between Level of Stress Variables and Marital Status Using One-Way Analysis of Variance

Stress Variable	Source of Variation	Degree of Freedom	Mean Square	F	p
Anxiety					
	Marital Status	1	5.75	.08	.7832
	Error	185	75.70		
Depression					
	Marital Status	1	11.52	.43	.5153
	Error	185	27.09		
Bodily Discomfort					
	Marital Status	1	8.10	.08	.7829
	Error	185	106.34		
Multivariate		3,183		.38	.7855

Note. n=187.

different in their stress level from single students.

As can be seen in Table 5, null hypothesis three was rejected since the 2-variable model was found as the best combination to predict each of the three stress measures. Considering anxiety among international students, social interactions with Americans and health conditions were the two best predictive variables. For depression, both social interaction with Americans and nationality were the two best predictive variables. For bodily discomfort, both health condition and duration of stay were the two best predictive variables.

Discussion

From the results of the research, it is concluded that for international students a poor health condition is suggestive of a high stress level; frequent social interaction with Americans predicts a lower stress level; and stress level becomes higher during the first and third year of stay in this country. Taking these findings into consideration, following suggestions are proposed to help international students alleviate their stress:

(1) That the University health clinic refer students with potential psychosomatic problems to the counseling center where they may obtain appropriate help to alleviate their stress.

(2) That inter-cultural community activities be pursued to enhance active involvement in American life and culture, and in other nationals.

(3) That students be informed of the nature of counseling services and be provided for information on stress management.

Table 5

Results of Testing Hypothesis Three Using Multiple Regressions to Explain Significant Variability in the Measures of Level of Stress

Measures of Stress Level	Regression Variables	Coefficient Estimates	p	R^2	F (df)	Overall p
Anxiety						
	Intercept	55.37		11.8%	11.289 (2, 167)	.0001***
	Social w/ American	- .55	.0010			
	Health	-1.73	.0072			
Depression						
	Intercept	9.70		14.5%	14.102 (2, 167)	.0001***
	Social w/ American	- .23	.0322			
	Korean	2.87	.0005			
Bodily Discomfort						
	Intercept	42.18		15.1%	14.705 (2, 166)	.0001***
	Health	-2.85	.0002			
	1<D<3 years	8.25	.0002			

Note. n=170. ***p<.001.

(4) That senior international students and academic advisor play active roles in informing new students of various services on campus.

For further research, individual characteristics such as personality traits and age level should be considered to address unexplained variability for the level of stress as well as other nationalities attending universities at different geographical locales.

Appendix

Checklist of Bodily Discomfort

1. Tension headaches
2. Difficulty in falling or staying asleep
3. Fatigue
4. constipation
5. Lower back pain
6. High blood pressure
7. Stomach indigestion
8. Hyperventilation
9. Dematitis
10. Migraine headaches
11. Diarrhea
12. Aching neck and shoulder muscles
13. Asthma attack
14. Colitis attack
15. Arthritis
16. Common flu or cold
17. Peptic ulcer
18. Cold hands or feet
19. Heart palipations
20. Allergy problems
21. Nausea or vomiting

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